

## **CHIARA LO PRETE**

Associate Professor of Energy Economics  
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### ACADEMIC APPOINTMENTS

07/2020 – present: Associate Professor of Energy Economics, The Pennsylvania State University  
07/2014 – 06/2020: Assistant Professor of Energy Economics, The Pennsylvania State University  
09/2012 – 06/2014: Ziff Environmental Fellow, Harvard University

### EDUCATION

2012: Ph.D., Geography and Environmental Engineering, The Johns Hopkins University  
2009: M.S., Geography and Environmental Engineering, The Johns Hopkins University  
2004: M.A., Energy Economics, Scuola Enrico Mattei, Milan, Italy  
2003: B.A., Economics (summa cum laude), LUISS University, Rome, Italy

### RESEARCH INTERESTS

- Competition and design of electricity markets
- Geopolitics of energy
- Natural gas markets
- Economics of energy infrastructure resilience
- Impacts of environmental regulations on power generation

### WORK EXPERIENCE

2004 - 2007: Energy Analyst  
Energy Studies Department, Eni S.p.A., Rome

### TEACHING EXPERIENCE

The Pennsylvania State University

- Econometrics II (graduate)
- Introduction to Electricity Markets (undergraduate)
- Introduction to Energy and Environmental Economics (undergraduate)
- Corporate Finance (undergraduate)
- The Geopolitics of Energy (undergraduate)

The Johns Hopkins University

- Introduction to Applied Econometrics (undergraduate) (Instructor, winter intersession 2012)
- Microeconomics (undergraduate) (Teaching Assistant)

## PUBLICATIONS

*Notes:* \* denotes a supervised PSU student; \*\* denotes a postdoctoral scholar I have mentored; \*\*\* denotes my Ph.D. or postdoctoral advisor.

### Journal articles

S. Fang, A. M. Jaffe, T. Loch-Temzelides and C. Lo Prete (2024). “Electricity grids and geopolitical coercion: a game theoretic analysis of the synchronization of the Baltic states’ networks with continental Europe”. *Energy Policy* 188, 114068.

C. Lo Prete, A. Tyagi\*\* and Q. Xu (2024). “California’s cap-and-trade program and emission leakage in the Western Interconnection: comparing econometric and partial equilibrium model estimates”. *Journal of the Association of Environmental and Resource Economists* 11(2), 359-402.

C. Lo Prete and S. Blumsack (2023). “Enhancing the reliability of bulk power systems against the threat of extreme weather: Lessons from the 2021 Texas electricity crisis”. *Economics of Energy & Environmental Policy* 12(2), 31-47.

A. Radhakrishnan\* and C. Lo Prete (2023). “Bulk power system reliability and resilience: An overview of planning and market measures”. Book chapter in *Advancing the Resilience of the Power Grid under a Changing Climate*, Wiley-IEEE Press Book.

C. Hohl\*, C. Lo Prete, A. Radhakrishnan\* and M. Webster (2023). “Intraday markets, wind integration and uplift in a regional U.S. power system”. *Energy Policy* 175, 113503.

C. Lo Prete and A. Radhakrishnan\* (2023). “Leaker-follower equilibria to examine investment decisions in grid resilience-enhancing measures”. *Risk Analysis* 43, 280-307.

N. Guo\* and C. Lo Prete (2019). “Cross-product manipulation with intertemporal constraints: an equilibrium model”. *Energy Policy* 134, 1-10.

C. Lo Prete, W.W. Hogan\*\*\*, B. Liu\* and J. Wang\* (2019). “Cross-product manipulation in electricity markets, microstructure models and asymmetric information”. *The Energy Journal* 40(5) 221-246.

C. Lo Prete, N. Guo\* and U.V. Shanbhag (2019). “Virtual bidding and financial transmission rights: an equilibrium model for cross-product manipulation in electricity markets”. *IEEE Transactions on Power Systems* 34(2), 953-967.

A. Kleit, C. Lo Prete, S. Blumsack and N. Guo\* (2019). “Weather or not? Welfare impacts of natural gas pipeline expansion in the Northeastern U.S.” *Energy Systems* 10(3), 593-633.

C. Lo Prete and B.F. Hobbs\*\*\* (2016). “A cooperative game theoretic analysis of incentives for microgrids in regulated electricity markets”. *Applied Energy* 169, 524-541.

C. Lo Prete and B.F. Hobbs\*\*\* (2015). “Market power in power markets: an analysis of residual demand curves in California’s day-ahead energy market in 1998-2000”. *The Energy Journal* 36(2), 191-218.

S. Cano-Andrade, M.R. von Spakovsky, A. Fuentes, C. Lo Prete and L. Mili (2015). “Upper level of a sustainability assessment framework for power system planning”. *Journal of Energy Resources Technology* 137(4), 1-11.

C. Lo Prete and C.S. Norman\*\*\* (2013). “Rockets and feathers in CO<sub>2</sub>-power markets? New evidence from the second phase of the EU ETS”. *Energy Economics* 36, 312-321.

C. Lo Prete, B.F. Hobbs\*\*\*, C.S. Norman\*\*\*, S. Cano-Andrade, A. Fuentes, M.R. von Spakovsky and L. Mili (2012). “Sustainability and reliability assessment of microgrids in a regional electricity market”. *Energy* 41, 192-202.

#### Refereed conference proceedings

C. Hohl\* and C. Lo Prete (2019). “Capacity markets versus energy-only markets: a comparison under increasing wind penetration”. *53rd Hawaii International Conference on System Sciences (HICSS-53)*, Maui, HI, January 7-10, 2020.

Y. Shan\*, C. Lo Prete, G. Kesidis and D.J. Miller (2017). “A simulation framework for uneconomic virtual bidding in day-ahead electricity markets”. *Proceedings of the 2017 American Control Conference (ACC)*, Seattle, WA, May-24-26.

C. Lo Prete and B.F. Hobbs\*\*\* (2013). “Modeling the interaction between microgrids and electric utilities: a regulator’s perspective”. *Proceedings of the Fourth IEEE International Conference on Smart Grid Communications*, Vancouver, October 21-24.

S. Cano-Andrade, M.R. von Spakovsky, A. Fuentes, C. Lo Prete, B.F. Hobbs\*\*\* and L. Mili (2012). “Multi-objective optimization for the sustainable-resilient synthesis/design/operation of a power network coupled to distributed power producers via microgrids”. *Proceedings of ASME International Mechanical Engineering Congress and Exposition*, vol. 6, Energy: Sustainable Technologies, Houston, TX, November 9-15.

#### Research reports to sponsors

A. Kleit, C. Lo Prete, S. Blumsack, N. Guo\* and K. Yoo (2014). “Weather or not? Welfare impacts of natural gas pipeline expansion in the Northeastern U.S.” *Report to Williams Company*, 1-46.

S. Blumsack, C. Lo Prete, U.V. Shanbhag and M. Webster (2018). Analysis of State Policy Interactions with Electricity Markets in the Context of Uneconomic Existing Resources: a Critical Assessment of the Literature. *Report to PJM Interconnection*, 1-53.

#### MANUSCRIPTS UNDER REVISION

“Time for a market upgrade? A review of wholesale electricity market designs for the future”, with K. Palmer and M. Robertson. [Resources for the Future Report 24-09](#).

“Comparing designs for resource adequacy in laboratory electricity markets”, with J. Wu\*, R. Rong B. Ünel and F. Zhu.

#### WORK IN PROGRESS

“Capacity Markets vs. “Energy Only” Markets with Improved Scarcity Pricing under Increasing Wind Penetration”, with C. Hohl\*.

“Comparing multi-settlement market designs for wind integration: an experimental study”, with C. Hohl\*, J. Wu\*, A. Kwasnica, R. Rong and F. Zhu.

“Grid reliability and competing claims for scarce natural gas during winter storms”, with A. Radhakrishnan\* and J. Wu\*.

“Enhancing energy adequacy in wholesale electricity markets: comparing forward energy contracts and capacity markets”, with J. Wang\*.

## FUNDED RESEARCH

SH<sub>2</sub>INE: Sustainable, Holistic Hydrogen INtegration Evaluation: models and analyses of human, environmental and policy dimensions. National Science Foundation. Role: PI. Total awarded: \$999,628. Funded: September 01, 2024 – August 31, 2027. In collaboration with J. Dunn and K. Suiseeya, Northwestern University; Z. Guo, University of Central Florida, and H. Wiseman, Penn State.

SAI: Strengthening energy infrastructure resilience and equity during extreme cold weather events. National Science Foundation. Role: PI. Total awarded: \$750,000. Funded: September 15, 2023 – August 31, 2026. In collaboration with A. Dubey, Washington State University; B. Ünel, Institute for Policy Integrity at NYU, and C. Mason, University of Wyoming.

Geopolitics of electricity and the weaponization of electricity trade. Center for Security Research and Education at Penn State. Role: PI. Total awarded: \$30,000. Funded: September 1, 2023 – June 30, 2025. In collaboration with A.M. Jaffe, New York University; S. Fang and T. Loch-Temzelides, Rice University.

A novel approach for estimating residential customer benefits from avoiding long-duration power interruptions. Center for Security Research and Education at Penn State. Role: PI. Total awarded: \$15,000. Funded: January 1, 2022 – December 31, 2022. In collaboration with D. Brent, Penn State, and B. Leibowicz, University of Texas at Austin.

CAREER: Capacity adequacy options for electricity markets with increasing renewable penetration: equilibrium models and laboratory experiments. National Science Foundation. Role: PI. Total awarded: \$500,000. Funded: March 01, 2020 – February 28, 2025.

Electricity market structure, wind penetration and information aggregation. Alfred P. Sloan Foundation. Role: PI. Total awarded: \$250,000. Funded: November 8, 2018 - May 31, 2022. In collaboration with M. Webster and A. Kwasnica, Penn State.

CRISP 2.0 Type 1: Economic mechanisms for grid resilience against extreme events and natural gas disruptions. National Science Foundation. Role: PI. Total awarded: \$250,000. Funded: September 1, 2018 - August 31, 2022. In collaboration with D. Kirschen and B. Zhang, University of Washington; total awarded for the collaborative grant: \$750,000.

Analysis of state policy interactions with electricity markets in the context of uneconomic existing resources. PJM Interconnection, L.L.C. Role: Co-PI. Total awarded: \$75,144. Funded: October 9, 2017 - October 31, 2018. In collaboration with S. Blumsack, U.V. Shanbhag, and M. Webster, Penn State.

Smart traction systems for weak power grids. Penn State Institutes for Energy and the Environment. Role: Co-PI. Total awarded: \$25,000. Funded: September 1, 2017 - August 31, 2018. In collaboration with S. Blumsack and N.R. Chaudhuri, Penn State.

Complementarity-based equilibrium models for the analysis of market power in electric distribution networks. E. Willard and Ruby S. Miller Faculty Fellowship, College of Earth and Mineral Sciences. Role: PI. Total awarded: \$50,000. Funded: September 1, 2016 - August 31, 2018.

Understanding the impacts of water scarcity on the evolution of the U.S. power system. Gladys Snyder Grant Program, College of Earth and Mineral Sciences. Role: PI. Total awarded: \$10,000. Funded: January 20, 2017 - December 31, 2017.

Market design and price formation in electric distribution networks deploying energy and demand resources. Penn State Institutes for Energy and the Environment. Role: PI. Total awarded: \$25,000. Funded: September 1, 2015 - August 31, 2016. In collaboration with M. Webster and U.V. Shanbhag, Penn State.

Theory and models of price manipulation through uneconomic bidding in wholesale electricity markets. Wilson Research Initiation Grant, College of Earth and Mineral Sciences. Role: PI. Total awarded: \$10,000. Funded: July 1, 2015 - June 30, 2016.

The economic impacts of expanding the Transco pipeline. Williams Company. Role: Co-PI. Total awarded: \$91,044. Funded: May 1, 2014 - July 31, 2014. In collaboration with A. Kleit and S. Blumsack, Penn State.

### CONFERENCE AND WORKSHOP PRESENTATIONS

- 2024: University of Tennessee at Knoxville (Invited)  
Penn State Workshop on the Geopolitics of Electricity (Event organizer and speaker)  
Atlantic Council (Invited)  
Jenner Energy Conference (Invited)  
Monash University, Conference dedicated to presenting drafts of papers for a Special Issue of The Electricity Journal titled “Market Design to Support a Low-Cost and Reliable Energy Transition” (Invited)  
Johns Hopkins University, Whiting School of Engineering (Invited)  
INFORMS 2024 Annual Energy Conference  
Cambridge University, Energy Policy Research Group  
Imperial College London  
Panthéon-Assas University (Paris II)
- 2023: College of Earth and Mineral Sciences Panel on the Energy Transition (Invited)  
Resources For the Future workshop on “Reforming Resource Adequacy Practices and Ensuring Reliability in the Clean Energy Transition” (Invited)  
NYU panel on “The Crisis in Ukraine: Geopolitics of Energy in Year One and Beyond” (Invited)  
The Doorstep (Invited)  
IEEE Power & Energy Society General Meeting (Invited)  
Resources for the Future “Friends of RFF seminar” (Invited)  
40<sup>th</sup> USAEE/IAEE North American Conference, Chicago, IL  
Johns Hopkins School of Advanced International Studies (Invited)  
Center for Strategic and International Studies (Invited)
- 2022: Institute for Policy Integrity (Invited)  
Critical Infrastructure Protection Workshop, session on “Regulating and Managing Energy Infrastructure Interdependencies” (Organizer and Moderator)  
Columbia University, Department of Earth and Environmental Engineering (Invited)  
Boise University, Energy Policy Institute (Invited)  
ISO New England (Invited)  
43<sup>rd</sup> IAEE International Conference  
39<sup>th</sup> USAEE/IAEE North American Conference, Houston, TX  
Energy Insights 2022 (Invited)
- 2021: IEEE PESGM (Invited)

- 2020: Hawaii International Conference on System Sciences (HICSS-53), Maui, HI  
University of Maryland, School of Public Policy (Invited)  
39<sup>th</sup> Annual Eastern Conference, Shawnee-on-Delaware, PA
- 2019: Sandia National Laboratories, Albuquerque, NM (Invited)  
Lehigh University, Department of Economics (Invited)  
Ohio State University, Department of Integrated Systems Engineering (Invited)  
37<sup>th</sup> USAEE/IAEE North American Conference, Denver, CO  
EMbeDS 2019 Workshop, Pisa, Italy (Invited)
- 2018: Centro de Investigación y Docencia Económicas (CIDE), Mexico City (Invited)  
Purdue University, Department of Industrial Engineering (Invited)  
University of Texas at Austin, Department of Electrical Engineering (Invited)  
Harvard University, Kennedy School of Government (Invited)  
IEEE Power & Energy Society General Meeting, Portland, OR  
11<sup>th</sup> International Workshop on Empirical Methods in Energy Economics, Milan, Italy  
36<sup>th</sup> USAEE/IAEE North American Conference, Washington DC
- 2017: 35<sup>th</sup> USAEE/IAEE North American Conference, Houston, TX  
10<sup>th</sup> International Workshop on Empirical Methods in Energy Economics, Los Angeles, CA  
36<sup>th</sup> Annual Eastern Conference, Annapolis, MD
- 2016: 86<sup>th</sup> Annual Meetings of the Southern Economic Association, Washington, D.C. (Invited)  
34<sup>th</sup> USAEE/IAEE North American Conference, Tulsa, OK  
35<sup>th</sup> Annual Eastern Conference, Shawnee-on-Delaware, PA  
West Virginia University, Department of Economics (Invited)
- 2015: 33<sup>rd</sup> USAEE/IAEE North American Conference, Pittsburgh, PA
- 2014: 37<sup>th</sup> IAEE International Conference, New York, NY  
INFORMS Annual Meeting, San Francisco, CA
- 2013: 11<sup>th</sup> Annual International Industrial Organization Conference, Boston, MA  
6<sup>th</sup> International Workshop on Empirical Methods in Energy Economics, Ottawa  
4<sup>th</sup> IEEE International Conference on Smart Grid Communications, Vancouver  
Annual Trans-Atlantic Infraday Conference, Washington D.C.
- 2012: American Economic Association Annual Meeting, Chicago, IL
- 2011: INFORMS Annual Meeting, Charlotte, NC  
4<sup>th</sup> International Workshop on Empirical Methods in Energy Economics, Dallas, TX
- 2010: ECOS 2010 Conference, Lausanne  
Annual Trans-Atlantic Infraday Conference, Washington D.C.

#### SUPERVISION OF PH.D. DISSERTATIONS

- Nongchao Guo (Ph.D., Department of Energy and Mineral Engineering) (July 2014 – July 2018).
- Cody Hohl (Ph.D., Department of Energy and Mineral Engineering) (September 2015 – December 2022).
- Ashish Radhakrishnan (Ph.D., Department of Energy and Mineral Engineering) (September 2019 - Present).
- Jiaying Wu (Ph.D., Energy, Environmental and Food Economics) (September 2021 - Present).
- Jingzhou Wang (Ph.D., Energy, Environmental and Food Economics) (September 2022 - Present).

## UNIVERSITY SERVICE

- Associate Head for Diversity, Equity and Inclusion (Department of Energy and Mineral Engineering, Penn State) (07/2021 – present)
- Undergraduate Program Chair for the Energy, Business and Finance program (Department of Energy and Mineral Engineering, Penn State) (01/2024 – 06/2024)
- Doctoral oral examination committee member (Department of Energy and Mineral Engineering, Department of Department of Agricultural Economics, Sociology, and Education, Department of Industrial Engineering, and Department of Computer Science and Engineering, Penn State)
- Master's thesis committee member (Department of Energy and Mineral Engineering, Penn State)
- Ph.D. candidacy committee member (Department of Energy and Mineral Engineering, Penn State)
- Member of the EME Executive Council

## PROFESSIONAL SERVICE AND OUTREACH

- Editorial Board Member, Economics of Energy & Environmental Policy
- Co-Editor of the Symposium “Energy transformation, social inclusion, and economic prosperity in Latin America”, Economics of Energy & Environmental Policy
- Co-Editor of the Symposium “What happened in Texas? Understanding the February 2021 black-outs and learning lessons to prepare the grid for extreme weather events”, Economics of Energy & Environmental Policy
- Editor of the “Contemporary Energy Issues in Europe” section, Current Sustainable/Renewable Energy Reports
- ENRE Best Publications Award committee, INFORMS (2024)
- Reviewer of grant proposals for ARPA-E and the National Science Foundation
- Referee for The Energy Journal, The Electricity Journal, IEEE Transactions on Power Systems, Energy Economics, Networks and Spatial Economics, Energy Policy, Energy, IIE Transactions, Energy Engineering
- Harvard Electricity Policy Group
- Future Power Markets Forum
- Austin Electricity Conference, University of Texas at Austin

## PROFESSIONAL AFFILIATIONS

Member, U.S. Association of Energy Economists (USAEE)

Member, Energy Systems Integration Group (ESIG)

Member, Institute for Operations Research and the Management Sciences (INFORMS)